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CENTRO DI ECONOMIA DEL LAVORO E DI POLITICA ECONOMICA

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EVALUATING ASIMMETRIES IN ACTIVE LABOUR
POLICIES: THE CASE OF ITALY.

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Abstract

This paper aims at analyzing whether Active Labour Market Programs (ALMP) could have different effects on unemployment and employment dynamics according to the particular region where the program is implemented. To this end, the research analyses alternative theoretical and econometric models thought to capture the possible effects that active labour market policies might have on labour forces dynamics. The econometric methodologies implemented are the Generalized Method of Moment (GMM) and the Panel Vector Autoregression (P-VAR). The evidence emerging from the GMM models suggests that the effects of ALMP on unemployment are not similar across the Italian regions. It follows that some active programs are likely to exert a greater effect in the South than in the North. The results of the P-VAR estimated models are synthesized in the impulse response analysis and the forecast error variance decomposition. The impulse response analysis suggests that an increase in ALMP lead to: (i) a decrease in the unemployment rate, and (ii) significant increase in labour force participation. More interestingly, results obtained from the error-variance decomposition analysis show that unemployment movements are not driven by shocks in the ALMP and that, especially in the northern regions, atypical contracts shocks account for a substantial portion of unemployment dynamics.

JEL Codes: C33, J64

Keywords: ALMP, Beveridge Curve, GMM, P-VAR

1. Introduction

Since the beginning of the Nineties, the OECD Jobs Study has emphasised the role of active labour market policies (ALMP) in reducing structural unemployment.

Moreover, the European Employment Strategy, launched in the Luxembourg Job Summit and restated in the Lisbon strategy, assigns to ALMP the task of increasing investments in human capital as well as of attracting more people to the labour market.

The reason why a government should adopt ALMP in reducing unemployment can be demonstrated by a variety of theoretical models. In these models, the implementation of ALMP leads to a positive effect on the matching process as well as on job competition. Other advantages are related to a rise in productivity and to a better allocation of labour among sectors and to geographic mobility.

However, in spite of theoretical and political preferences on ALMP spending, real data show a quite different picture. In the period from 1985 to 2000, the OECD countries did not significantly increase expenditure on active programmes as a percentage of the GDP - less than 1%, on the average. Moreover, there is no tendency to switch resources from passive to active programmes.

Actually, there are ambiguous effects that ALMP might have on the regular labour demand. An active labour policy might produce a crowding-out effect through the well-known deadweight effect, the substitution effect, or an accommodation effect on wage setting.

For these reasons, the net employment effect of ALMP is an empirical issue. From this consideration, derives the importance of monitoring and evaluating the ALMP.

There is a large quantity of empirical literature focusing on whether ALMP have positive effects on unemployment. Most of these studies apply microeconomic techniques to evaluate the effects of ALMP on individual performance. Other studies use macroeconomic models to analyze the net effect of ALMP on the whole economy.

In this paper, we have chosen a macroeconomic perspective. The empirical analysis is based on a variety of econometric techniques thought to capture the possible effects that active labour market policies might have on employment and unemployment dynamics. In particular, the aim of the paper is to assess whether ALMP might have asymmetric effects in different regions where the program applies.

The remainder of the paper proceeds as follows. Section 2 analyzes the OECD view concerning the ALMP effectiveness in reducing the structural unemployment. In Section 3, the paper focuses on the theoretical effect of ALMP. In Section 4, the study highlights some peculiarities of the Italian labour market. Section 5 moves to the empirical models of labour market policies and presents the results of the GMM and the P-VAR models. The section also presents the main results of the impulse response analysis as well as of the forecast error variance decomposition. In Section 6, concluding remarks end the paper.

2. The ALMP and the OECD Perspective

The well-known OECD Jobs Study (OECD, 1994; OECD, 1996) strengthened the emphasis on active labour market policies (ALMP) as a means of fighting the structural unemployment (Layard, Nickell and Jackman, 1991). The general agreement was on the need to shift the focus of labour market policies from the passive provision of income support to more active measures which assist reemployment. The reason was that subsidies, raising the reservation wage, have strong negative effects on the length of unemployment and on job search intensity. Active labour measures, on the other hand, can improve the matching of the demand and supply of labour and reduce the long-term unemployment of disadvantaged workers¹.

¹ OECD criteria split public spending on labour programmes into so-called “active and “passive” measures. The former aims at improving the employability of the unemployed by raising their job-related skills and the functioning of the labour market. We distinguish five groups of measures: (1) public employment services, (2) labour market training, (3) youth measures, (4) subsidized

The European Employment Strategy (EES), launched in the Luxembourg Job Summit (November, 1997), on the basis of the new provisions in the Employment Title of the Treaty, and revamped in the Lisbon strategy (Lisbon European Council, March, 2000), has given a new impulse to ALMP, stressing its importance not only as an alternative to subsidies but also in itself. As a matter of fact, the European Strategy assigns to ALMP the task of increasing the adaptability of workers and enterprises, of attracting more people to the labour market and of making the investment in human capital more effective by adopting a preventive and more active approach towards the unemployed (Commission of European Communities, 2003).

Country reviews have however revealed that ALMP have been quite a limited success, suffering from ineffective delivery, monitoring and evaluating mechanisms, as well as poor targeting and other design problems. This means that, in spite of theoretical and political preference in favour of ALMP spending, data show a quite different picture. Spending on active programmes on the average in the OECD countries increased very little from 1985 to 2000 as a percentage of the GDP (from 0.7 to 0.8) (Martin and Grubb, 2001). The same trend occurred in the European countries (from 0.9 to 1.0). There is no tendency to switch resources from passive to active programmes, both moving in accordance with unemployment. Figures 1 and 2 show the evolution of expenditure in active and passive policies across various EU and non-EU countries over the 1980s and the 1990s.

employment, (5) measures for the disabled. The latter are income transfers to unemployed, namely (1) unemployment benefits, and (2) early retirement pensions paid for labour market reasons (Martin and Grubb, 2001).

Figure 1 Ratio of Active to Passive Expenditure for Employment over GDP (1985)

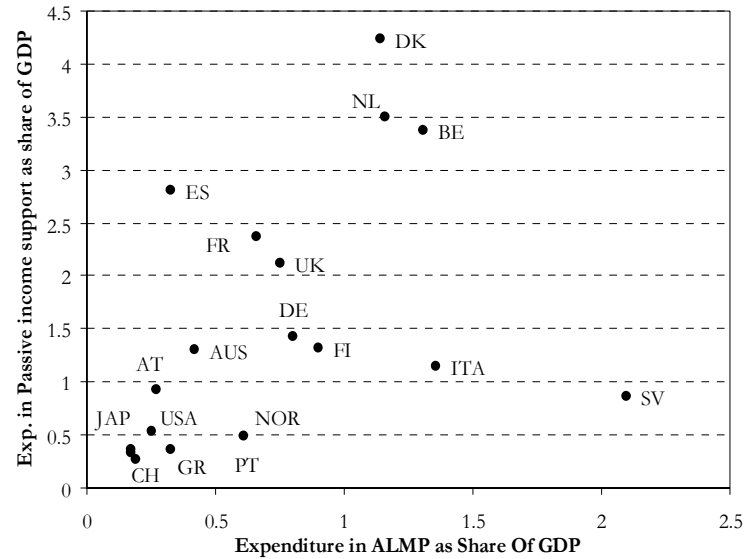
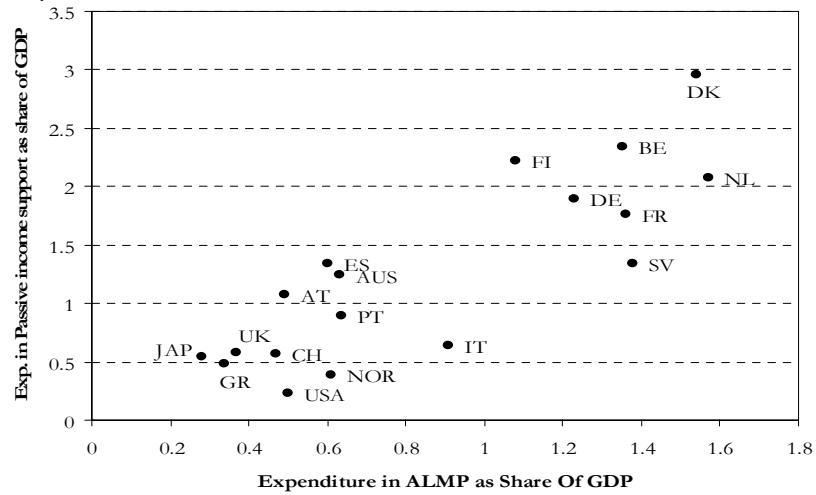


Figure 2 Ratio of Active to Passive Expenditure for Employment over GDP (2000)

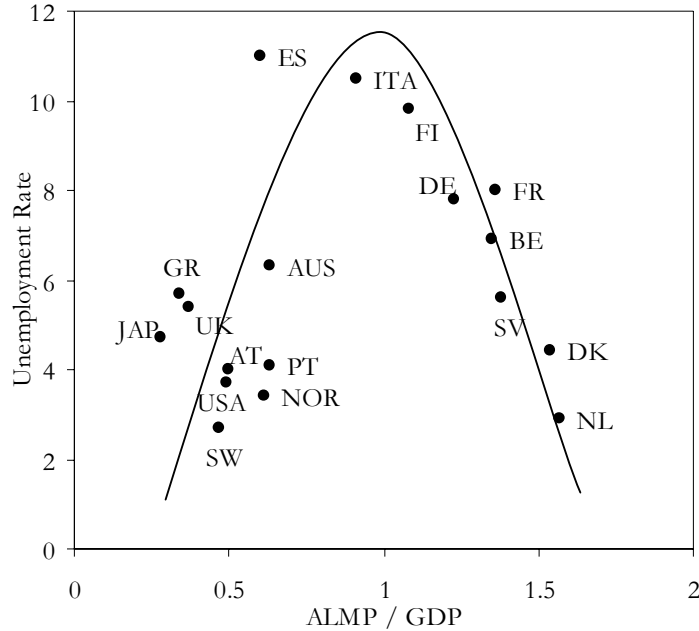


Source: OECD, Employment Outlook, various issues

In terms of the level of expenditure, measured as a share of the GDP, three groups of countries can be distinguished. The first group includes countries such as Denmark, the Netherlands and Belgium, which had a high level of expenditure in both active and passive policy measures during the 1980s. An intermediate group includes countries with a higher than average expenditure in active, but not in passive income support, such as Sweden and Italy, and countries with a higher than average expenditure in passive, but not active measures, such as Spain. The last and largest group includes countries such as Japan, the USA, Austria, Portugal, Greece and Switzerland, with a very low level of expenditure in both active and passive measures. From the '80s to the '90s, the policies in the three groups of countries have not changed. There has been a general reduction in expenses for passive measures, while a group of European countries -Spain, France, Germany and Finland- have substantially increased expenditure for active measures. Sweden, on the contrary, has reduced its percentage of ALMP.

Figure 3 shows that the hypothesis of a direct negative relation between ALMP expenditures and the unemployment rate is not verified. As a matter of fact, countries with a low percentage of ALMP/GDP, but also the countries that designate a higher proportion of the GDP to ALMP, have a lower unemployment rate. The highest unemployment rate occurs in the countries in an intermediate position.

Figure 3 Relation between ALMP Expenditures and Unemployment Rate



3. The Theoretical Effects of ALMP

From a theoretical point of view the effects of ALMP can be studied by two models the conclusions of which are very similar: the well-known Jackman, Layard and Nickell labour market framework, distinguishing between a wage-setting and a labour-demand relationship (Jackman, Layard and Nickel 1991; Calmfors 1994; Calmfors and Lang 1995) and the Beveridge Curve framework derived from a matching function combined with job search theory². To better analyze the ALMP functioning over the labour market, we can refer to the second type of model.

² The theoretical foundations of the Beveridge Curve are substantially twofold: the first, starting from a model of Hansen, derives the matching function from an aggregation over distinct markets in the presence of frictions and of limited mobility of labour. The second refers to a model of matching in a stock-flow framework. For a recent review see Petrongolo and Pissarides, 2001.

The Beveridge Curve (or uv curve) represents the non-linear negative relationship between the unemployment rate $u=U/(U+E)$ and the vacancy rate $v=V/(V+E)$, where E is employment:

$$uv = f(u) \quad f' < 0 \text{ e } f'' > 0 \quad (1)$$

It can be shown that the slope and shifts of the curve are due to the behaviour of workers in finding a job, the behaviour of employers in screening applicants for the vacancy and to the 'matching technology' in the labour market by which searching workers and searching firms are brought together.

In a stock-flow model, the change of unemployed stock (ΔU) can be viewed as a result of the inflow (I) of workers into the unemployment pool coming from the non-labour forces (p) or from employees (e) and the outflow (O) of workers from unemployment toward the two statuses in a period of time (t):

$$\Delta U = (I_t^p + I_t^e) - (O_t^p + O_t^e) \quad (2)$$

The same dynamics can be adopted for the change in the stock of vacancies.

$$\Delta V = Q_t - O_t^e \quad (3)$$

Q represents the number of new vacancies registered in time t and O_t^e is the number of filled vacancies that corresponds to the outflow of unemployed workers toward employment, assuming that there aren't vacancies neither filled by workers coming from the non-labour force pool nor cancelled vacancies.

The usual hypothesis is:

The inflow from employment into unemployment is a percentage (s) of the employment stock (E):

$$I_t^e = s_t E_t \quad (4)$$

where s is the separation rate.

The outflow from unemployment toward employment can be formalized as a percentage (v) of unemployment:

$$O_t^e = v_t U_t \quad (5)$$

where v can be viewed as the average probability that an unemployed worker at the beginning of period t finds a job during period t.

On the other hand, the outflow from vacancies can be written as a percentage (p) of V:

$$O_t^e = p_t V_t \quad (6)$$

where p can be described as the probability of matching, i.e. the probability that a given vacancy gets filled by an unemployed worker during period t.

Consequently, the change of unemployment stock in period t can be rewritten as:

$$\Delta U = s_t E_t - p_t V_t + I_t^p - O_t^p \quad (7)$$

We can refer to the matching model (Hall, 1977; Pissarides, 1990) to identify the factors determining the matching probability p. As stated before, the matching probability derives from the ways by which the match between unemployed workers and unfilled jobs takes place, from the behaviour of workers in searching for a job and from the behaviour of employers in screening applicants for a vacancy. Therefore, the probability depends on the probability that a vacancy will be contacted by at least one job seeker (contact probability c) and the probability that the job contact took place (acceptance probability r):

$$p_t = c_t r_t \quad (8)$$

Under very simple initial assumptions on job seekers and vacancy supply characteristics (Hall, 1977), we can hypothesize

that contact probability derives from the relation between unemployment (U) and vacancies (V). In other words, the greater the number of vacancies to the number of unemployed, the higher the contact probability, and consequently, the higher the probability that an unemployed worker fills a job.

The probability of a job searcher getting a contact with an employer is $1/V$. Therefore, the probability that unemployed workers don't contact employers placing vacancies can be written, assuming a sufficiently high number of vacancies, as (Hall, 1977):

$$\left(1 - \frac{1}{V}\right)^U = \left[\left(1 - \frac{1}{V}\right)^{-V}\right]^{-U/V} \cong e^{-U/V}$$

Probability c is due, also, to two other variables: the fraction of active job seekers over total unemployed workers (α), that means that in a labour market where there are many active searchers in the unemployment pool, even a small increase in vacancies leads to a relatively strong reduction in unemployment; furthermore, the probability of contact is due to a mismatch by regions, by occupations and by qualifications (γ). Therefore the contact probability can be written as:

$$c_t = 1 - e^{-\alpha\gamma U_t/V_t} \quad (9)$$

A simple job search model (McCall 1970; Mortesen 1970; Pissarides, 1990) provides us the determinants of acceptance probability r . The decision of a job seeker to accept a job is based on an optimization problem according to which he finds “the optimal duration of a job search by comparing the discounted earnings from the best wage offer found during his search with the discounted search costs” (Frish 1984, pag. 62). The reservation wage (w_r) represents, therefore, the expected return from pursuing the best stopping rule. This, besides, is influenced by direct and indirect search costs and unemployment benefits. In the same way, the employer acceptance decision arises from a comparison of the applicants productive capacity, not easy to establish a priori

and then determined by some screening process affected by variables such as employment subsidies, individual characteristics of workers and skill level, and his reservation productivity level (z^r) for a given job.

The acceptance probability can, therefore, be written as:

$$r = r(w^r, z^r) \quad (10)$$

with $\frac{\partial r}{\partial w^r} < 0; \frac{\partial r}{\partial z^r} < 0$

Inserting (9) and (10) in (6), the matching function becomes:

$$O_t^e = r_t(w^r, z^r)(1 - e^{-\alpha\gamma U_t/V_t})V_t \quad (11)$$

In other words, the matching function could be interpreted as a constant return production function of job matches where the inputs are the unemployed and vacancies.

The essential characteristics of the Beveridge curve can be derived by applying the steady state conditions to the flow model of unemployment. The steady state conditions are $\Delta U = 0$ and $\Delta E = 0$, and the flow equation (7), after the substitutions becomes:

$$I_t^p - O_t^p + s_t E_t = r_t(w^r, z^r)(1 - e^{-\alpha\gamma U_t/V_t})V_t \quad (12)$$

the characteristic of which is to be a negative convex function of U and V . As the following equations show:

$$\frac{dU}{dV} = -\alpha\gamma \frac{e^{-\alpha\gamma(U/V)}}{(e^{-\alpha\gamma(U/V)} - 1)v + \alpha\gamma U e^{-\alpha\gamma(U/V)}} v < 0 \quad (13)$$

$$\frac{d^2U}{dV^2} > 0$$

Finally, after dividing all variables of (12) by labour forces L_s , the condition $U=V$ (or $u=v$ where $u=U/L_s$ and $v=V/L_s$) determines the natural rate of unemployment (NRU), i.e. structural and

frictional unemployment corresponding to the equilibrium in the labour market:

$$NRU = \frac{iq^p - oq^p + sn}{r(w^r, z^r)(1 - e^{-\alpha\gamma})} \quad (14)$$

where:

$$iq^p = \frac{I^p}{L_s}; oq^p = \frac{O^p}{L_s}; \frac{E}{L_s} = n$$

Therefore, the slope of the Beveridge Curve depends on the search intensity of job seekers and on labour market mismatches, while the NRU depends also on the reservation wage and reservation productivity.

As stressed in Jackman, Pissarides and Savouri (1990), active labour policies significantly affect the position and slope of the Beveridge curve³. Indeed, more active than passive labour policies cause the Beveridge curve to shift to the origin of axis since they reduce labour market mismatches and search frictions. Moreover, ALMP make a given job creation programme more effective with regard to employment and they also cause flattening of the curve. Finally, the matching process is speeded up as obstacles are removed.

Calmfors, 1994 analyzes various effects of ALMP, distinguishing between: (i) effects on the matching process; (ii) effects on the competition for jobs; (iii) productivity effects; (iv) effects on the allocation of labour among sectors and geographic mobility; (v) direct crowding-out effects on regular labour demand; and (vi) accommodation effects on wage setting.

ALMP, particularly job-broking and counselling activities, make the matching process more efficient as they promote a more active search by the job seekers. In our model, the coefficient affected by this type of treatment effect is α i.e. the fraction of active job seekers over total unemployed workers. As a matter of fact, the job searcher pool (S) is composed of unemployed (U) and ALMP participants (P), and we can write:

³Jackman, Pissarides and Savouri, 1990, pag. 480.

$$S = U + a'P$$

Where a' is an index of search intensity. If the search intensity of the ALMP participant to ALMP is greater ($a' > 1$), it is clear that an increase of ALMP participation increases \square and, consequently, the matching process.

On the other hand, there may also be an opposite locking in effect if a' is < 1 , i.e. if participants do not find job opportunities before programmes are completed or continue to have a low probability of being employed after the programme⁴.

Job-matching improvement makes the hiring process of firms easier and then lowers the cost of posting vacancies, as well as limiting wage settings. In our model, these effects can be synthesized by a reduction of the reservation wage and reservation productivity.

Reservation productivity and the reservation wage are also affected by the effects on competition for jobs and productivity effects. It is self evident that participation in ALMP (especially training programmes and job creation measures providing on-the-job training) increases the productivity of job searchers, even if their reservation wages increase also. The net effect is an empirical issue. Employment subsidies, instead, directly decrease labour costs for the firm. ALMP participation may also have a positive effect on labour force participation, increasing the motivation to actively seek for work and therefore increasing the competition for the available jobs (Johansson, 2001).

Finally, the desired effect of ALMP is to change the allocation of the work force between sectors, skills and regions (i.e. to reduce the degree of mismatch in our model). If there is full employment among skilled workers or in certain regions or sectors and wages are flexible, employment subsidies or training programmes that try to increase the probability of hiring unskilled workers or workers

⁴ Caroleo and Pastore, 2004 have detected the existence of a “training trap” for youth unemployed in Italy in which participation in training programmes increases the probability of repeating this type of program without improving the probability of finding a job.

employed in regions with high unemployment and wage rigidity have a positive effect on output and employment.

Equally, a policy that tries to reallocate workers from unskilled to skilled jobs, from low productivity sectors to high productivity sectors or from low labour demand regions to high labour demand regions, also have a positive effect on gross output. As a consequence, if, for example, unskilled workers are retrained and become more skilled, the labour supply in the skilled sector augments and, if the wages become more flexible, labour demand augments to the same extent. On the other hand, the unskilled sector will be unaffected because of wage rigidity. (Layard, 1999; Calmfors, Forslund and Hemstöm 2002).

An unintentional side effect is that ALMP may crowd out (displacement effect) regular labour demand (especially concerning to schemes of subsidized employment). In fact, a deadweight effect occurs when the same person would have been hired even in the absence of such subsidies and a substitution effect occurs when the subsidies lead employers to substitute one category of workers for another⁵.

An indirect crowding-out effect can be found to the extent that ALMP improve the welfare of the unemployed: higher income rather than unemployment benefits for participants; a higher level of psychological well-being due to being employed; improvement in future labour market prospects; extension of income support beyond the maximum unemployment benefit period. In this case, the reservation wage is increased and the intensity of the job search is reduced. Wage pressure is increased.

4. A Macroeconomic Evaluation of ALMP in Italy

For these reasons, the net employment effect of ALMP is an empirical issue; thus, as the EES stressed, it is important to implement the monitoring and evaluation of these policies (Fay,

⁵ The *displacement effect* can have a positive employment effect to the extent that the employment of the long-term unemployed (outsiders) crowds out the employment of insiders, so that the latter group meets more competition and moderates wage settings.

1996). However, while monitoring has now been established in Italy (MLSP, various issues), evaluation has only been carried out so far according to the conventional programme-oriented approach to policy evaluation⁶.

The empirical research on the effects of ALMP is of two types: microeconomic and macroeconomic. Microeconomic studies evaluate the effects of participation in ALMP for the participating individuals, comparing their labour market outcome to the outcome that would have prevailed if they had not participated in an active program. Macroeconomic studies examine aggregate, general equilibrium effects. The question is whether ALMP represent a net gain for the whole economy. There are two alternatives to consider: ALMP positively affect both unemployment and output or the effect is simple distributional, i.e. if work is shifted from the old to the young or from a region to another, etc. (Bellmann and Jackman, 1996). These studies concern the evaluation of a Beveridge curve or a matching function, as well as a wage-setting function, the evaluation of the direct, crowding-out effect or the effects of ALMP on labour force participation (Hujer and Caliendo 2000).

The method chosen to evaluate ALMP in Italy is a reduced form that allows estimating the net effects of ALMP participation on employment or unemployment in a regional framework (Hujer, Blien, Caliendo and Zeiss, 2002). This type of methodology has been applied especially in the studies based on OECD data explaining the cross-country variation in unemployment rates by the cross-country variation in a number of labour market institutions; one of them is ALMP (Layard, Nickell and Jackman, 1991; Nickell, 1997; Scarpetta, 1996; Nickell and Layard, 1999; Blanchard and Wolfers, 2000)⁷.

⁶ For a comprehensive survey of the evaluation studies carried out in Italy, see Trivellato, Martini and Rettore, 2001.

⁷ The main difference between studies based on OECD data and our methodology concerns the measure of ALMP. The former generally use the expenditure (as a percent of the GDP) on ALMP; we use the participants in programmes of active policies. The measure of ALMP, used in a large number of studies using OECD data is: $\gamma = b_r / u_y$ (see appendix in Calmfors, Forslund and

There are a lot of weaknesses which arise in a macroeconomic assessment of active labour market policies. As we work with aggregated data, the results tend to become vague and less robust. We have to deal in many cases with relatively crude data, making use of proxy variables when necessary. However, the major problem is that of endogeneity or simultaneity. Given that governments react to rising unemployment or other labour market problems with increased policy efforts, it becomes very hard to distinguish the effect of policy on the labour market. Basically, expenditures on ALMP can affect the unemployment rate, and it may be equally the case that the level of unemployment affects spending on ALMP.

Data based on the participation in active and passive labour policies was provided by the “Rapporto di Monitoraggio” of the MLPS, reconstructed on a monthly basis from 1996:1 to 2002:6 and by regions. The main active policies are: a) Mixed cause contracts; b) subsidies for long-term or short-term employment; c) incentives for the stabilization of short-term contracts, d) Incentives for self-employment. In contrast to the OECD definition of ALMP, the “Rapporto di Monitoraggio” restricts analysis only to the measures for youth and employment subsidies. Recently, data has also been produced on training measures and on public employment services, but with no information on the time series.

Outcome variables are the labour market indices representing the main objectives of the European Employment Strategy: the employment rate, the unemployment rate and the youth unemployment rate.

The period refers to the years 1996-2002 which corresponds to a considerable, positive cycle of increase in employment. If we compare this period with a similar, previous one (1985-1991), we can observe that an increase in employment occurred in spite of a relative stagnation in economic growth.

Hemstrom 2002). r is the number of participants as a fraction of the labour force, u is the unemployment rate, y is the GDP per capita, b_r is the expenditure on ALMP per programme participant. Consequently, the relation of the two measures is the following:

$$\rho = \gamma u (b_r / y)^{-1}$$

	1996-2002	1985-1991
Δ Employment rate	1,2%	1,0%
Employed per year	271.000	224.000
Δ PIL	+1,7%	+2,7%
Employment/PIL elasticity	0,70	0,38

There are several explanations for that positive cycle: the introduction of new, more flexible forms of labour contracts (atypical contracts), an increase of the employment of women and employment in the service sector and the concurrence of a period of wage moderation. Moreover, one of the major explanations is the objective of our research: the implementation of the European Employment Strategy (begun in 1998) and a renewed impulse to ALMP.

The following figures represent a broad measure of the relationship between the ALMP expenditures and the Passive Labour Market Policies (PLMP) expenditures made by the Italian regions. In this case, it can be noticed that, in the period from 1996 to 2002, there was a generalized reduction in the percentage of passive policies over GDP.

Figure 4 ALMP and PLMP as percentage of GDP – 1996

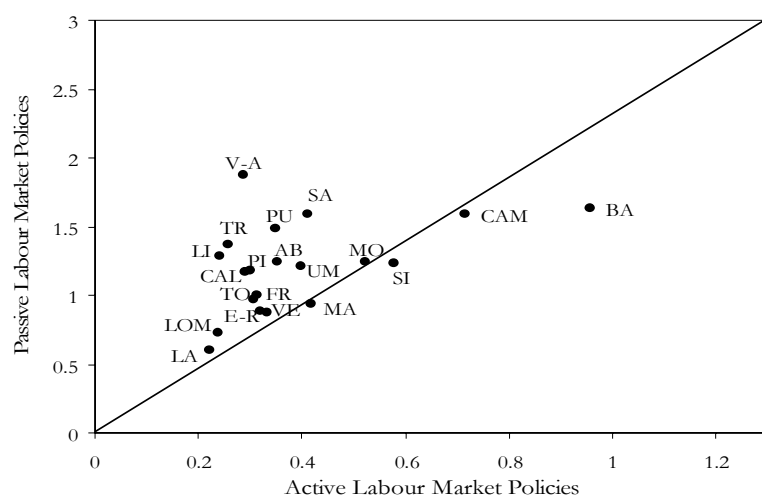
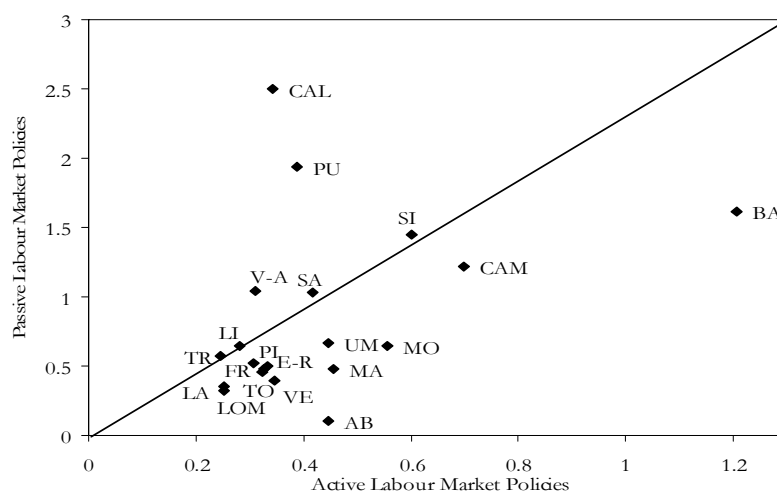


Figure 5 ALMP and PLMP as percentage of GDP – 2000



Source: MPLS, Rapporto di Monitoraggio various issues

5. Empirical Models of Labour Market Policies

The empirical analysis is based on two econometric techniques thought to capture the possible effect that alternative active labour market policies might have on unemployment and employment dynamics. In particular, the aim of this empirical part consists of assessing whether ALMP could have different effects according to the particular region where the program has been implemented. The study employs panel data models for the 20 Italian regions. Each model is estimated for several dependent variables including employment rate, unemployment rate and youth unemployment rate. The explicative variables are a set of active labour market policies. Moreover, some variables enter into the estimation as instruments. These variables are the GDP per-capita, the gross-fix investments, the GDP per-worker and the school-attendance rate.

The sample period goes from 1996:1 to 2002:6. The data used in the empirical analysis were drawn from different sources. The monthly data on the labour market policies have been provided by the Ministry of Welfare. The data on unemployment and employment are drawn from Istat.

The significant difference between the Southern and the Northern Italian labour markets make it necessary to analyze both areas separately. The number of cross sections for Southern Italy is 8 and 12 for Northern Italy.

As stated above, the study implements different econometric techniques to analyze the afore-mentioned issues. There are two techniques used. The first refers to the Generalized Method of Moment (GMM). The second consists of applying the Vector Autoregression framework to panel data (P-VAR).

5.1 *The effectiveness of alternative ALMP: a GMM Model*

The modern approach to the estimation of system instrumental variables is based on the principle of the generalized method of moment (GMM). In order to analyze the effects of ALMP on the unemployment rate, we estimate the following basic equation:

$$u_{i,t} = \alpha u_{i,t-1} + \gamma x_{it-1}^{MCC} + \varphi x_{it-1}^{SE} + \vartheta x_{it-1}^{JS} + D_{i,t} + \eta_{i,t} + \varepsilon_{i,t} \quad (1)$$

with

$$i = 1, \dots, N \quad \text{and} \quad t = 1, \dots, T.$$

In the specified equation, x_{it-1}^{MCC} represents the mixed cause contracts ratio; x_{it-1}^{SE} is the subsidized employment ratio; x_{it-1}^{JS} represents the job stabilization ratio; $D_{i,t}$ is a vector of time invariant region-specific effect; $\eta_{i,t}$ is a vector of region invariant time specific effect; and $\varepsilon_{i,t}$ is an i.i.d. vector of disturbances.

Each ratio has been constructed as the total number of participants in a program in a particular region divided by the total number of working-age population of the same region. Then, the response coefficients γ , φ and ϑ measure the effect that an increase of participants in active labour market programs has on unemployment dynamics.

Time and region dummies are very important components of the specification. Time dummies may reduce the reverse causality problem if the timing of adverse shocks is correlated between regions. Region fixed effects capture all time-invariant institutional and economic characteristics explaining why one region has a different-from-average unemployment rate.

The importance of these region-specific effects cannot be minimized. For example, since the mid-1990s, Abruzzo has spent, on the average, a lower percentage of the GDP on ALMP than Campania (4 percent for Abruzzo and 7 percent for Campania), yet Abruzzo had a higher business-sector employment rate in the sample period (35 percent compared to 26 percent for Campania). If only variables capturing institutional effects (which, in general, are not very precise) were used to control for region-specific effects, part of the differences in employment caused by other institutional factors would be wrongly attributed to ALMP spending.

The specification in equation (1) forms a dynamic panel data model, where the dependent variable is partly explained by its past value.

We now concentrate on the relative ability of alternative active policies to affect the unemployment rate, the employment rate and the youth unemployment rate.

The three policies we consider are the mixed cause contracts (henceforth, MCC); the subsidized employment (SE) that represents the sum of the subsidies for long-term or short-term hiring; and the job stabilization (JS), that is the incentives for the stabilization of short-term contracts and the incentives for self-employment.

The specified dynamic panel data model has been estimated by using three alternative methods. Table 1 reports the GMM estimator in first differences (GMM-DIF), the system estimator (GMM-SYS), and the OLS results.

Table 1: GMM Estimates of the Unemployment Rate

South	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Unemployment (t-1)	0.75	[0.05]	0.85	[0.03]	0.89	[0.02]
Mixed Cause Contracts (t-1)	-0.10	[0.30]	-0.17	[0.22]	-0.14	[0.06]
Subsidized Employment (t-1)	-0.44	[0.17]	-0.21	[0.05]	-0.23	[0.08]
Job Stabilization (t-1)	-0.12	[0.05]	-0.08	[0.04]	-0.09	[0.03]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	57.53	[0.000]	847.5	[0.000]		
Wald Test of Dummies Significance	1151	[0.000]	24430	[0.000]		
Sargan Test	87.25	[0.000]	56.47	[0.021]		
First-order serial correlation	-1.653	[0.098]	-1.774	[0.076]		
Second-order serial correlation	-1.762	[0.078]	-1.89	[0.047]		
North	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Unemployment (t-1)	0.75	[0.02]	0.87	[0.28]	0.91	[0.01]
Mixed Cause Contracts (t-1)	-0.35	[0.09]	-0.32	[0.78]	-0.31	[0.11]
Subsidized Employment (t-1)	-0.14	[0.22]	-0.10	[0.08]	-0.19	[0.05]
Job Stabilization (t-1)	-0.23	[0.11]	-0.32	[0.15]	-0.79	[0.28]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	1325.0	[0.000]	507.2	[0.000]		
Wald Test of Dummies Significance	4535.0	[0.000]	157.2	[0.000]		
Sargan Test	59.3	[0.000]	61.8	[0.006]		
First-order serial correlation	-5.8	[0.000]	-1.9	[0.061]		
Second-order serial correlation	2.1	[0.021]	2.0	[0.01]		

From Table 1 we can see that in the northern regions, an increase in the mixed cause contracts (MCC) produces a larger response in terms of unemployment reaction with a decrease of 35 basis points in the GMM-DIF model. In the South, the response is much smaller. An increase of one percent in MCC induces a fall in the unemployment rate of 10 basis points.

The results suggest that while SE is more effective in the South (-0.44) than in the North (-0.14), an increase in the job stabilization (JS) produces a larger decrease in the northern unemployment (-0.23) with respect to the fall in the southern unemployment rate (-0.12).

Table 2 presents the results of the GMM estimates for the model in which the employment rate is considered the dependent variable.

Table 2: GMM Estimates of the Employment Rate

South	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Employment (t-1)	0.75	[0.03]	0.90	[0.04]	0.91	[0.02]
Mixed Cause Contracts (t-1)	0.19	[0.11]	0.22	[0.14]	0.17	[0.09]
Subsidized Employment (t-1)	0.50	[0.16]	0.42	[0.13]	0.37	[0.06]
Job Stabilization (t-1)	0.02	[0.03]	0.01	[0.05]	0.11	[0.02]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	275.5	[0.000]	179.3	[0.000]		
Wald Test of Dummies Significance	32890	[0.000]	1970	[0.000]		
Sargan Test	76.09	[0.000]	59.5	[0.000]		
First-order serial correlation	-2.041	[0.041]	-2.759	[0.006]		
Second-order serial correlation	-1.832	[0.067]	-2.445	[0.008]		
North	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Employment (t-1)	0.80	[0.02]	0.89	[0.01]	0.90	[0.01]
Mixed Cause Contracts (t-1)	0.30	[0.11]	0.32	[0.07]	0.33	[0.06]
Subsidized Employment (t-1)	0.33	[0.12]	0.21	[0.12]	0.21	[0.13]
Job Stabilization (t-1)	0.36	[0.17]	0.37	[0.15]	0.63	[0.32]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	1386.0	[0.000]	4514.0	[0.000]		
Wald Test of Dummies Significance	1837.0	[0.000]	800.0	[0.000]		
Sargan Test	75.2	[0.000]	115.8	[0.000]		
First-order serial correlation	-2.8	[0.006]	-2.6	[0.009]		
Second-order serial correlation	-1.7	[0.084]	1.8	[0.070]		

Also in this case, a rise of 1% in the mixed caused contracts induces a larger increase in the northern employment rate (0.30) than in Southern employment (0.19). The opposite is true for the other active policy we considered. In the South, an increase in SE lead to a rise in the employment rate of 0.5%, while in the North the effect is of an increase of 0.33%.

The evidence coming from Table 2 corroborates the finding shown for the unemployment rate model. In fact, the coefficients for the selected policy are both significant. However, it seems that while JS exerts a greater effect in the South, MCC is more efficient in the North.

Finally, we look at the ability of the three active policy indicators to reduce the youth unemployment rate.

The relative size of the coefficients observed above is not valid when we consider the ability of the policy in reducing the youth unemployment rate. In fact, Table 3 suggests a higher JS coefficient for the North as well as a lower MCC coefficient for the South. In general, the active labour policy response coefficients for the Southern regions are lower than the ones obtained for the Northern regions.

Table 3: GMM Estimates of the Youth Unemployment Rate

South	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Youth Unemployment (t-1)	0.90	[0.03]	0.87	[0.03]	0.91	[0.02]
Mixed Cause Contracts (t-1)	-0.25	[0.13]	-0.23	[0.15]	-0.10	[0.49]
Subsidized Employment (t-1)	-0.31	[0.11]	-0.43	[0.16]	-0.41	[0.18]
Job Stabilization (t-1)	-0.13	[0.26]	-0.13	[0.16]	-0.27	[0.13]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	2206	[0.000]	579.6	[0.000]		
Wald Test of Dummies Significance	388	[0.000]	13990	[0.000]		
Sargan Test	79.32	[0.000]	65.9	[0.002]		
First-order serial correlation	-1.923	[0.054]	-1.951	[0.051]		
Second-order serial correlation	-1.58	[0.114]	0.1764	[0.860]		

North	GMM-DIF		GMM-SYS		OLS	
	Coeff.	Std.Error	Coeff.	Std.Error	Coeff.	Std.Error
Youth Unemployment (t-1)	0.69	[0.03]	0.81	[0.02]	0.78	[0.01]
Mixed Cause Contracts (t-1)	-0.38	[0.62]	-0.38	[0.29]	-0.46	[0.52]
Subsidized Employment (t-1)	-0.80	[1.68]	-0.83	[1.15]	-0.68	[0.30]
Job Stabilization (t-1)	-0.52	[2.39]	-0.47	[1.68]	-0.21	[2.51]
	Statistic	p-value	Statistic	p-value		
Wald Test of Joint Significance	32.4	[0.000]	350.0	[0.000]		
Wald Test of Dummies Significance	5056.0	[0.000]	283.7	[0.000]		
Sargan Test	98.2	[0.000]	61.5	[0.007]		
First-order serial correlation	-6.0	[0.000]	-2.6	[0.009]		
Second-order serial correlation	-1.0	[0.314]	0.8	[0.451]		

5.2 Unemployment, ALMP and Atypical Contracts: a P-VAR model

There has been a growing interest in using panel VAR models for applied labour policy analysis. Problems concerning the evaluation of the effect of regional policies are naturally studied in this framework. Vector autoregression (VAR) models are widely used in econometric studies in a broad variety of fields. The extension to panel data represents an interesting challenge due to the possible presence of cross-sectional heterogeneity.

Let us consider a panel VAR model with fixed time dimension T and derive asymptotic properties of a proposed estimation method with respect to the cross-sectional dimension N .

In particular, we estimate a second order VAR using a four variables system of the unemployment rate, participation rate, a ratio of atypical contracts over the total employees and active labour market policy. The reason why we include atypical contracts in the estimated model leads from the consideration that, in recent years, there have been significant change in the structure of employment. This structural change has resulted in a decrease in permanent, full-time 'typical' employment and an increase in the so-called 'atypical', 'contingent' or 'non-standard' employment.

We start from a panel structural dynamic linear model of the form:

$$A \begin{bmatrix} u_{i,t} \\ p_{i,t} \\ AC_{i,t} \\ ALMP_{i,t} \end{bmatrix} = D_{i,t} + C(L) \begin{bmatrix} u_{i,t-1} \\ p_{i,t-1} \\ AC_{i,t-1} \\ ALMP_{i,t-1} \end{bmatrix} + B \begin{bmatrix} \mathcal{E}_{i,t}^u \\ \mathcal{E}_{i,t}^p \\ \mathcal{E}_{i,t}^{AC} \\ \mathcal{E}_{i,t}^{ALMP} \end{bmatrix} \quad (2)$$

where u_t is the unemployment rate; $p_{i,t}$ represent the participation ratio; $AC_{i,t}$ is a ratio of atypical contracts; and $ALMP_t$ is the active labour market policy rate as constructed above; $C(L)$ is a finite-order lag polynomial matrix. The region fixed effects, i.e. the vector D , account for institutional differences as well as other region-specific unobserved influences on unemployment. This means that the system allows for different region-specific constant terms in each equation, since some regions may have a higher average unemployment rate and active labour policy than others, for reasons that are not captured by the explanatory variables. In the specified model, the four variables are assumed to be stationary. The structure of this system incorporates feedback relationship between u_t and $ALMP_t$. This means that the two variables are allowed to affect each other

contemporaneously. The contemporaneous relations among the variables are described in the A matrix.

The structural model has a VAR representation:

$$\begin{bmatrix} u_{i,t} \\ p_{i,t} \\ AC_{i,t} \\ ALMP_{i,t} \end{bmatrix} = \Gamma + A^{-1}C(L) \begin{bmatrix} u_{i,t-1} \\ p_{i,t-1} \\ AC_{i,t-1} \\ ALMP_{i,t-1} \end{bmatrix} + \begin{bmatrix} e_{i,t}^u \\ e_{i,t}^p \\ e_{i,t}^{AC} \\ e_{i,t}^{ALMP} \end{bmatrix} \quad (3)$$

with $E(e_t e_t') = \Sigma$

The identification of the structural parameters has solved imposing linear restriction on the elements of A and B taking into accounts the following relation between VAR innovations and structural disturbances:

$$A \begin{bmatrix} e_{i,t}^u \\ e_{i,t}^p \\ e_{i,t}^{AC} \\ e_{i,t}^{ALMP} \end{bmatrix} = B \begin{bmatrix} \varepsilon_{i,t}^u \\ \varepsilon_{i,t}^p \\ \varepsilon_{i,t}^{AC} \\ \varepsilon_{i,t}^{ALMP} \end{bmatrix}$$

Starting from the $\frac{n(n+1)}{2}$ free elements of $\hat{\Sigma}$, the lack of identification emerges from the estimation of $n^2 + n^2$ parameters contained in A and B.

The identification problem is solved by restricting the contemporaneous relation matrix to a lower triangular form. This solution imposes a recursive structure on the economy, resulting in a particular causal ordering of the variables in the system. In particular, we impose the following restrictions:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 \\ a_{41} & a_{42} & a_{43} & 1 \end{bmatrix} \begin{bmatrix} e_{i,t}^u \\ e_{i,t}^p \\ e_{i,t}^{AC} \\ e_{i,t}^{ALMP} \end{bmatrix} = \begin{bmatrix} b_{11} & 0 & 0 & 0 \\ 0 & b_{22} & 0 & 0 \\ 0 & 0 & b_{33} & 0 \\ 0 & 0 & 0 & b_{44} \end{bmatrix} \begin{bmatrix} \varepsilon_{i,t}^u \\ \varepsilon_{i,t}^p \\ \varepsilon_{i,t}^{AC} \\ \varepsilon_{i,t}^{ALMP} \end{bmatrix}$$

The assumption ($a_{14} = 0$) means that $ALMP_t$ does not have a contemporaneous effect on u_t . In other words, both ε_t^u and ε_t^{ALMP} shocks effect the contemporaneous value of $ALMP_t$, but only ε_t^u shocks affect the contemporaneous value of u_t .

The timing of the model can be summarized as follows: a shock to labour policy instruments ALMP in period t affects the unemployment rate at time t+1. In fact, at time t the unemployment rate is predetermined, so it cannot be influenced by any policy instrument. For example, an increase in active labour policy leads to a rise in labour force participation, thereby facilitating a decrease in the unemployment rate.

The outlined model has been estimated separately for south and north. Moreover, for each macro area we estimated two different models: in Model 1 the variable AC consists of the ratio of the part-time workers over the number total employees, while in Model 2 AC is the ratio of fixed-term workers over the total dependent employees.

The four different specifications (Model 1 and Model 2 for South and North) are estimated to assess the possible asymmetries between northern and southern region unemployment in response to a shock to AC and ALMP.

5.3 Results of Impulse-Response Analysis

In this section we present the estimated dynamic effects of AC and active labour policy shocks on unemployment. In particular, we examine the similarity of the unemployment responses in each area. This is accomplished by using impulse response functions

with a structural decomposition of the variance covariance matrix explained above. A 20-quarter horizon is considered.

The estimated responses to a 1% increase in unemployment and ALMP are reported in Figures 6, 7, 8 and 9. Each response is provided with the associated asymptotic confidence bands.

The impulse responses for the southern regions are significantly larger than those for the northern regions. The patterns of the responses are qualitatively similar in the two areas. Importantly, the results also suggest that the unemployment rate in the selected regions responds to identical labour policy shocks with different speeds and movements, as well as with different dimensions of the effects.

In fact, a positive ALMP shock decreases unemployment. Moreover, after an initial delay, the response function shows a hump-shaped pattern that reaches the maximum decline after roughly two years in the North and three years in the South.

The different adjustment speeds of the unemployment rates to ALMP shocks for the two selected areas can be partly explained by the existence of a higher degree of labour market rigidities in the South. This finding suggests the need for an improvement in the 'efficiency' of the labour market functioning.

On the other hand, the different dimensions of the effect can be explained by considering the existing differences both in the number of vacancies and in the unemployed of the two areas. While the northern regions are characterized by a large number of vacancies and a small number of unemployed (the upper part of the Beveridge curve), in the southern regions there are a small number of vacancies and a large number of unemployed (the lower part of the Beveridge curve). It follows that an identical increase in ALMP has a larger effect on the southern unemployment rate.

Figure 6 Impulse-Response Analysis for the South: Model 1

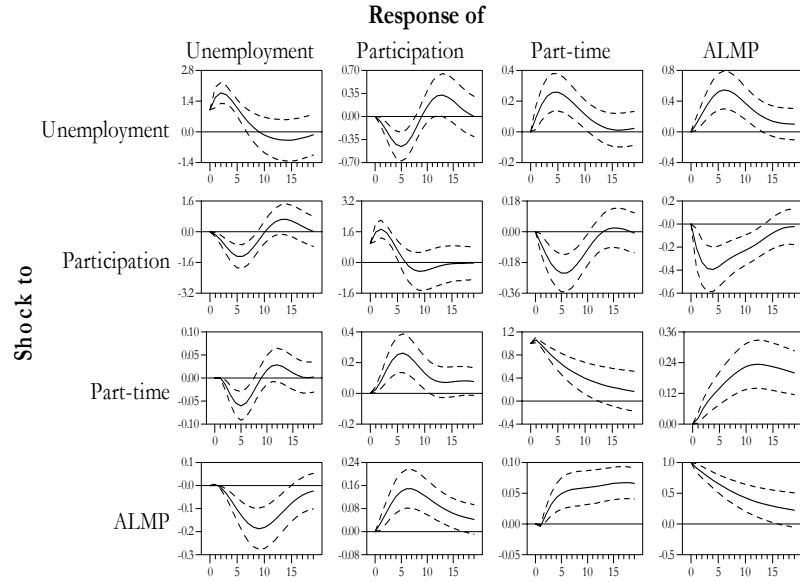


Figure 7 Impulse-Response Analysis for the South: Model 2

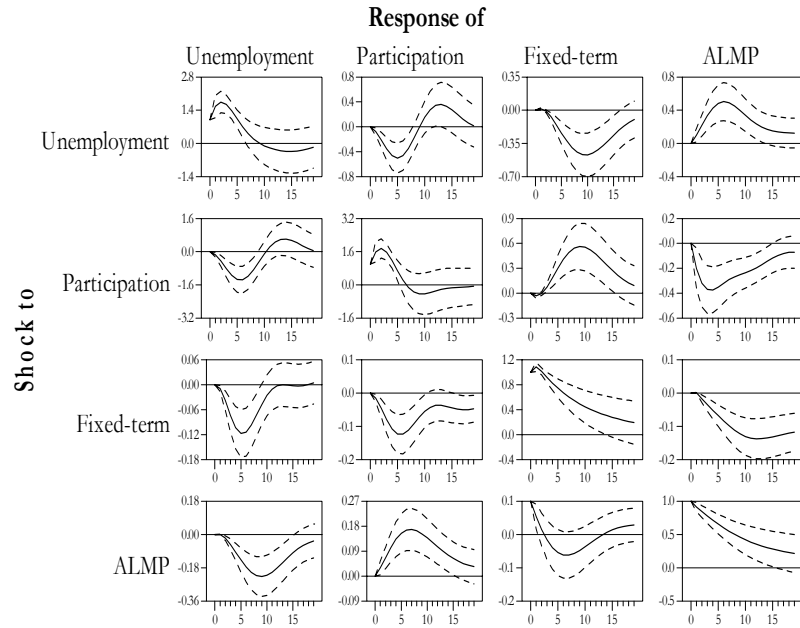


Figure 8 Impulse-Response Analysis for the North – Model 1

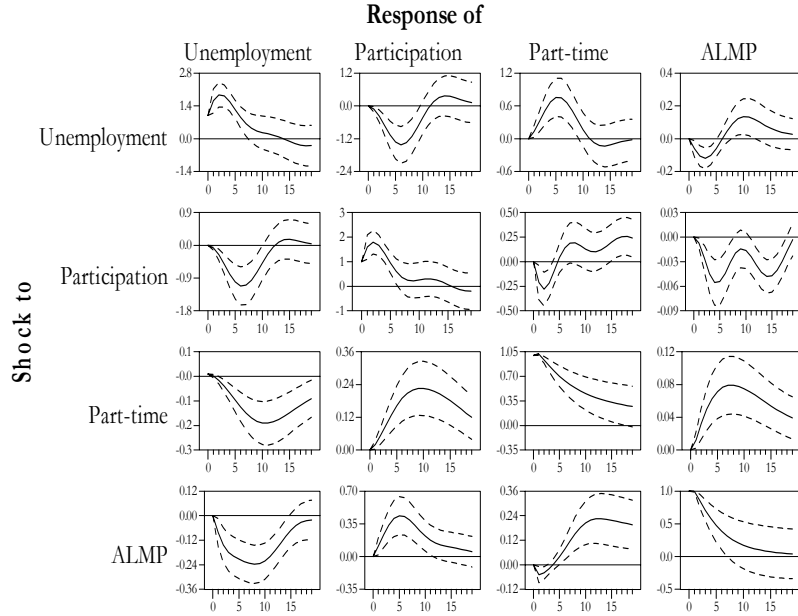
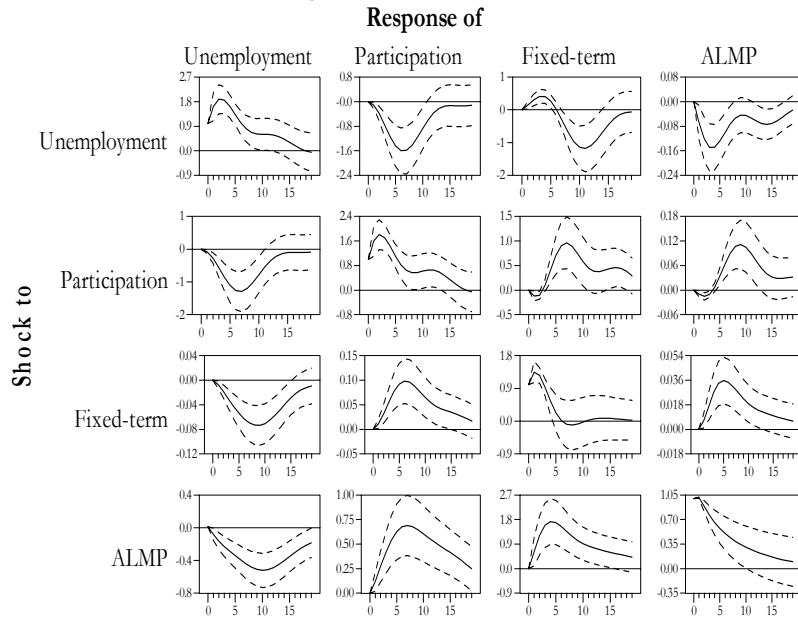


Figure 9 Impulse-Response Analysis for the North – Model 2



The average response and the maximum impact of a contractionary labour policy shock are shown in Table 8.

Table 8 Estimated Response Function Features

	South				North			
	Model 1		Model 2		Model 1		Model 2	
	Part-time	Almp	Fixed-term	Almp	Part-time	Almp	Fixed-term	Almp
Average Effect	-0.01	-0.09	-0.04	-0.12	-0.13	-0.14	-0.04	-0.34
Maximum Effect	-0.06	-0.19	-0.12	-0.23	-0.20	-0.24	-0.07	-0.53
Time to maximum	6	10	10	10	12	9	10	11
Time to die out	16	20	24	22	22	20	20	24

Table 8 outlines some key characteristics of the estimated response functions. In particular, the table gives information about the maximum impact and the average responses of the unemployment rate to ALMP and AC structural shock. The table also considers the time that a shock takes to exert its maximum effect on unemployment as well as the time to die out.

Despite some qualitative similarities, the table seems to suggest a different quantitative response across regions. In both areas, an ALMP shock produces a decline in the unemployment rate. However, the dimension of the effect is quite dissimilar. While in the South the unemployment rate decreases by more than 20 basis points (Model 2 - South), an ALMP shock in the North reduces the unemployment rate by 53 basis points (Model 2 - North). The maximum impact of the fixed-term is observed in the southern regions: -12 basis points. Moreover, the effect of fixed-term shock reaches its maximum effect later than in the North. It means that in the Southern regions, the unemployment rate appears to be more influenced by the changes in the number of fixed-term contracts. Finally, concerning the time the shock takes to die out, there are no large differences across regions. A fixed-term shock lasts longer in southern regions. However, an ALMP shock seems to be more persistent in the north.

Asymmetries are also detected in the response of unemployment rate to an exogenous part-time shock. Again, the largest responses are observed in the North; in particular, the response of unemployment in the northern regions reaches a

maximum of twenty basis points after 12 months, while the reaction of the southern Italian regions is smaller and quicker: six basis points after 6 months.

5.4 Results of Forecast Error Variance Decomposition (FEVD)

An important tool developed in the S-VAR framework is the forecast error variance decomposition. The main strength of this analysis is its ability to capture the weight of different variable innovations on a given variable forecast error variance decomposition.

In other words, it gives information on the percentage of variation in the forecast error of a variable explained by its own innovation and the proportion explained by innovations in other variables at different horizon.

Table 9 depicts the forecast error variance decomposition of the unemployment rate, in the four model estimated above and up to two year horizon, due to the four structural shocks.

Table 9: Fraction of the Unemployment Rate that FEVD attributed to the four structural shocks

South								
Horizon	Model 1				Model 2			
	Unemp.	Partic.	Part-time	Almp	Unemp.	Partic.	Fixed-term	Almp
1	100	0	0	0	100	0	0	0
6	95.4	0.8	0.3	3.2	91.0	0.5	2.3	6.5
12	83.1	2.3	0.8	13.4	79.2	1.6	9.9	9.7
18	80.6	3.4	1.3	14.7	76.7	2.3	10.9	10.2
24	79.6	3.6	1.7	15.1	75.7	2.5	11.3	10.6

North								
Horizon	Model 1				Model 2			
	Unemp.	Partic.	Part-time	Almp	Unemp.	Partic.	Fixed-term	Almp
1	100	0	0	0	100	0	0	0
6	83.1	6.3	3.8	6.7	83.5	6.4	5.4	4.7
12	65.4	8.8	17.3	8.5	71.1	9.6	10.1	9.3
18	56.9	8.4	25.4	9.3	68.8	9.1	10.7	11.4
24	54.9	8.6	27.2	9.3	67.5	9.4	11.1	12.0

From the above table we can retrieve useful information about the relative power of ALMP and AC in affecting the unemployment dynamics at different horizons.

Hence, according to the variance decomposition at short horizons, ALMP innovations do not play a major role in the monthly fluctuations of the unemployment rate. The dynamics of unemployment is largely dominated by its own shocks and indicate that short-run fluctuations in the unemployment rate display no association with active labour market programs as well as with the dynamics of the atypical contracts. For long horizons, we find that both ALMP and atypical contracts exert a certain role in determining the unemployment dynamics. This influence varies across the regions.

In the southern regions, the unemployment is essentially driven by its own shocks. The fixed-term ratio, although greater than the part-time variable, do not significantly affect the movements in the unemployment rate. After two years, it explains 11% of the unemployment changes. Also the ALMP shocks do not seem to explain more than a 15% of the unemployment changes.

On the contrary, in the northern regions, the unemployment dynamics seem to be partially explained by the increase in the atypical contracts. In particular, the movements in the part-time ratio, after 2 years, explain almost 30% of the unemployment variation.

We can conclude that the unemployment dynamics is differently explained in the two areas. In the South neither ALMP nor AC seems to explain the changes in the unemployment rate: the unemployment is driven by its own shocks. On the contrary, in the northern regions, the unemployment dynamics is significantly explained by the part-time workers dynamics.

6. Conclusions

The paper dealt with the theoretical and the empirical measurement of the of the ALMP ability to reduce regional unemployment.

The relevance of the issues is related to the possible asymmetries the differences in the economic structure of the

Italian regions may arise concerning the effectiveness of alternative labour market programs.

The econometric methodologies implemented were the Generalized Method of Moment (GMM) and the Panel Vector Autoregression (P-VAR).

Concerning the GMM framework, we estimated a single equation dynamic panel data model for several dependent variables including employment rate, unemployment rate and youth unemployment rate. The evidence emerging from these models suggested that the effects of ALMP on unemployment are not similar across the Italian regions. Some programs are likely to exert a greater effect in the South than in the North.

The second methodology relies on the P-VAR framework. We estimated four different models in order to outline the effect that ALMP and the atypical contracts have on the unemployment dynamics.

The impulse-response analysis highlighted the presence of divergences across the Italian regions. Importantly, the results suggest that the unemployment rate in the selected regions responds to identical labour policy shocks with different speeds and movement, as well as with different dimensions of the effects. The same is true for the response of unemployment rate to AC shocks.

Finally, the forecast error variance decomposition provides information on how much various structural shocks affect the behaviour of each variable at different horizons. From this analysis we conclude that the unemployment dynamics is differently explained in the two areas. In the South neither *ALMP* nor *AC* seems to explain the changes in the unemployment rate: the unemployment is driven by its own shocks. On the contrary, in the northern regions, the unemployment dynamics is significantly explained by the part-time workers dynamics.

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